

**SCRIBING METHOD FOR SAPPHIRE SUBSTRATE**

Patent Number: JP58044738  
Publication date: 1983-03-15  
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Requested Patent: ☐ JP58044738  
Application Number: JP19810142773 19810910  
Priority Number(s):  
IPC Classification: H01L21/78  
EC Classification:  
Equivalents:

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**Abstract**

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**PURPOSE:** To prevent a fine crack at the periphery of a groove having 110- 200µm of depth formed on a sapphire substrate by scanning a laser condensed beam to the forward seam direction of the substrate and forming the groove.

**CONSTITUTION:** A spot of a CW exciting Q switch YAG laser is repeatedly emitted to a sapphire substrate to form a groove. Then, a crack is produced at the periphery of a groove when the scanning speed is constant, and the characteristics of the depth of the groove are designated by a curve (a) in the reverse seam direction scanning and by a curve (b) at the forward seam direction scanning. On the contrary, no crack is formed with the depth less than 110µm, and the cracks are abruptly increased when deeper than 200µm in the forward seam direction. Accordingly, the laser condensed beam is scanned in the forward seam direction of the substrate to form grooves of approx. 110-200µm in depth in a lattice shape. Then, when the substrate is bent along the grooves, no crack is produced at the periphery of the groove, thereby improving the yield and the reliability.

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